

SECTION 2-2

SECTION SUMMARY

The Sun

Guide for Reading

- ◆ How does the sun get its energy?
- ◆ What are the layers of the sun's atmosphere?
- ◆ What are some features of the sun's surface?

The sun's mass is 99.8 percent of all of the mass in the solar system. Because the sun is so large, its gravity is strong enough to hold all of the planets and comets in orbit.

The sun has an interior and an atmosphere. The sun is a ball of glowing gas that is about three fourths hydrogen and one fourth helium. There are also small amounts of other chemical elements.

The sun's interior is like a giant furnace. But the sun does not get its energy from burning fuels such as oil. **Instead, the sun's energy comes from nuclear fusion.** In the process of **nuclear fusion**, hydrogen atoms join together to form helium. The temperature inside the sun's **core**, or center, reaches about 15 million degrees Celsius, high enough for nuclear fusion to occur. The energy produced by nuclear fusion, including light and heat, gradually moves from the core through the sun's atmosphere and into space. Some of the light and heat reaches Earth, becoming Earth's main source of energy.

The sun's atmosphere has three layers: the photosphere, the chromosphere, and the corona. The inner layer of the sun's atmosphere is called the **photosphere**. Photo means "light." This is the sphere that makes light.

At the beginning and end of a solar eclipse, you can see a reddish glow around the photosphere. This glow comes from the middle layer of the sun's atmosphere, the **chromosphere**. *Chromo* means "color."

In the middle of a total solar eclipse, the moon also blocks light from the chromosphere. At these times an even fainter layer called the corona is visible. The corona sends out a stream of electrically charged particles called **solar wind**. Sometimes these particles enter Earth's atmosphere at the North and South Poles, creating rippling sheets of light in the sky called *auroras*.

Features on or above the sun's surface include sunspots, prominences, and solar flares. **Sunspots** are areas of gas on the sun that are cooler than the gases around them. The cooler gases give off less light, causing them to look darker than the rest of the photosphere. The number of sunspots on the sun varies over a period of 10 or 11 years. Scientists are studying the cycles to see if they affect Earth. Sunspots usually occur in pairs or groups. Reddish loops of gas called **prominences** link different parts of sunspot regions. Sometimes the loops in sunspot regions suddenly connect, releasing large amounts of energy. The energy heats gas on the sun to millions of degrees Celsius, causing the gas to explode out into space. These explosions are known as **solar flares**.

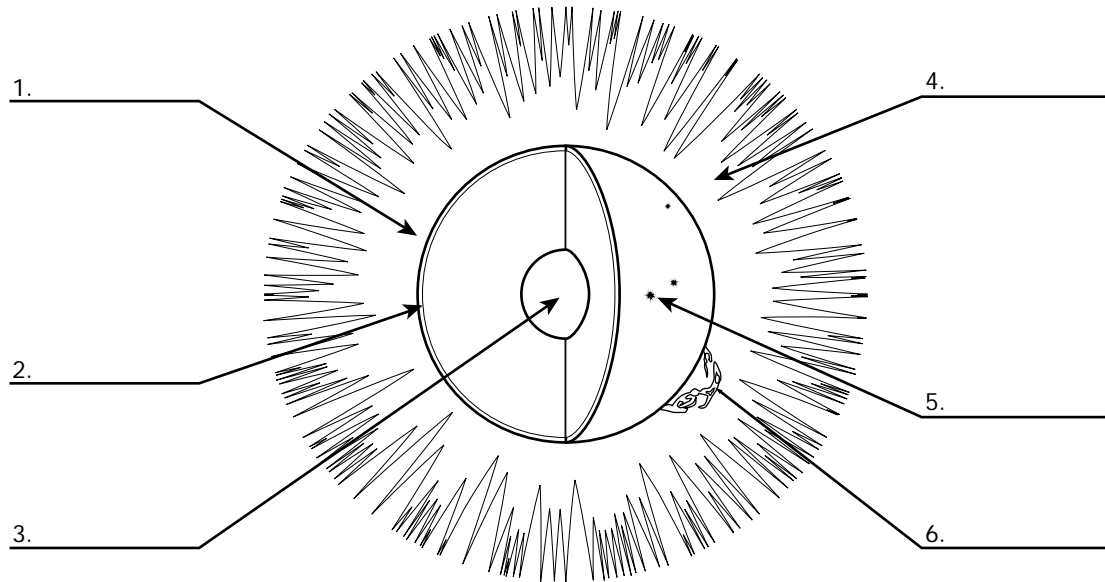
SECTION 2-2

REVIEW AND REINFORCE

The Sun

◆ Understanding Main Ideas

Label the diagram of the sun below.



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◆ Building Vocabulary

Match each term with its description by writing the letter of the correct description in the right column on the line beside the term in the left column.

_____ 7. solar flare	a. the layer of the sun's atmosphere that makes light
_____ 8. core	b. the layer of the sun's atmosphere that has a reddish glow
_____ 9. chromosphere	c. the layer of the sun's atmosphere that looks like a halo during an eclipse
_____ 10. sunspot	d. areas of gas on the sun that are cooler than the gases around them
_____ 11. corona	e. reddish loops of gas that link parts of sunspot regions
_____ 12. nuclear fusion	f. explosions that occur when the loops in sunspot regions suddenly connect
_____ 13. photosphere	g. a stream of particles produced by the corona
_____ 14. solar wind	h. the center of the sun
_____ 15. prominence	i. the joining of hydrogen atoms to form helium